A COMPARATIVE STUDY ON THE EFFECTIVENESS OF TENS WITH TRIGGER POINT RELEASE IN REDUCIUNG MYOFASCIAL PAIN OF UPPER TRAPEZIUS

Dissertation work submitted to

THE TAMIL NADU DR. M. G. R. MEDICAL UNIVERSITY,

Chennai-32

towards partial fulfillment of the requirements of

MASTER OF PHYSIOTHERAPY

Degree programme

Submitted by

Reg no: 27092310

P.P.G. COLLEGE OF PHYSIOTHERAPY

9/1, keeranatham road,

Saravanampatti,

Coimbatore-641035

www.ppgphysiotherapy.ac.in

P.P.G. COLLEGE OF PHYSIOTHERAPY

9/1, KEERANATHAM ROAD,

SARAVANAMPATTI,

COIMBATORE-641035.

www.ppgphysiotherapy.ac.in

Dissertation work entitled

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Reg no: 27092310

Under the guidance of

Prof G.SUJATHA PRIYA DHARSHINI M.P.T (Ortho)., MIAP.,

Dissertation submitted to

THE TAMILNADU DR. M. G. R. MEDICAL UNIVERSITY,

CHENNAI-32.

Project work evaluated on ----------

Internal Examiner **External Examiner**

CERTICATE I

This is to certify that the dissertation work entitled " **A COMPARATIVE STUDY ON THE EFFECTIVENESS OF TENS WITH TRIGGER POINT RELEASE IN REDUCIUNG MYOFASCIAL PAIN OF UPPER TRAPEZIUS"** was carried out by **Reg. no.27092310** P.P.G College of physiotherapy, Coimbatore-35, affiliated to The Tamilnadu Dr. M.G.R medical university, Chennai-32, under the guidance of prof**..G.SUJATHA PRIYADHARSHINI . M.P.T (ortho)., MIAP.,**

Dr. K. RAJA SENTHIL M.P.T (Cardio-Resp).,MIAP.,PhD

Principal

CERTIFICATE II

This is to certify that the dissertation work " **A COMPARATIVE STUDY ON THE EFFECTIVENESS OF TENS VERSUS TENS WITH TRIGGER POINT RELEASE IN REDUCIUNG MYOFASCIAL PAIN OF UPPER TRAPEZIUS"** Was carried out by **Reg. No.27092310** P.P.G College of physiotherapy Coimbatore-35, affiliated to The Tamilnadu Dr. M.G.R. Medical University, Chennai-32, under my Guidance and direct supervision.

Prof. G SUJATHA PRIYADHARSHINI M.P.T (ortho)., MIAP.,

GUIDE

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A COMPARATIVE STUDY ON THE EFFECTIVENESS OF TENS WITH TRIGGER POINT RELEASE IN REDUCING MYOFASCIAL PAIN OF UPPER TRAPEZIUS

ABSTRACT

Objective: To find out of the Effectiveness of TENS and TENS with trigger point release in reducing myofacial pain of upper trapezius.

Methods: 30 Subjects were selected on the basics of inclusion and exclusion criteria. All the subjects were divided equally into two groups, control Group and experimental Group based on Simple Random Sampling Technique. Before starting the training, pre-test scores are measured by using VAS scale. Control group received tens and experimental group received tens with trigger point release for 30 minutes, and both the groups received conventional therapy. At the end of four months, post-test scores of both groups were taken by used measure vas scales.

Results: There is significant difference between the post treatment values of TENS and tens with trigger point groups in selected criteria; TENS being the more effective in reducing the intensity of pain .

Conclusion: This study can be concluded that both Transcutaneous Electrical Nerve Stimulation and Trigger release have got beneficial effect in reducing the pain intensity in patients with Myofascial Trigger point in Upper Trapezius.

Key words: Myofacial Trigger Point, TENS, Pain Intensity, Pain , Numerical Pain Rating Scale,.

INTRODUCTION

Myofascial pain syndrome is a chronic form of muscle pain. The pain of myofascial pain syndrome centers around sensitive points in our muscles called trigger points. The trigger points can be painful when touched. And the pain can spread throughout the affected muscle.

Nearly everyone experiences muscle pain from time to time that generally resolves in a few days. But people with myofascial pain syndrome have muscle pain that persists or worsens. Myofascial pain caused by trigger points has been linked to many types of pain, including headaches, jaw pain, neck pain, low back pain, pelvic pain, and arm and leg pain.

Treatment for myofascial pain syndrome can bring relief in many cases. Treatment options include physical therapy, trigger point injections or medications

A taut band in a muscle may be necessary as a precursor to development of a Trigger point. Taut bands are common in asymptomatic individuals, but patients with them are more likely to develop a Trigger point. A latent Trigger point can develop into an active trigger point for a number of reasons. Psychological stress, muscle tension and physical factors, such as poor posture, can cause a latent Trigger point to become active.

The pathology of Myofascial trigger point is not clearly defined. Current research supports sensitization of low-threshold mechanosensitive afferents associated with dysfunctional motor endplates in the area of the Trigger points projecting to sensitized

dorsal horn neurons in the spinal cord. Pain referred from Trigger points and local twitch response may be mediated through the spinal cord after stimulation of a sensitive locus.

Many factors lead to myofascial pain. Abnormal stresses on the muscles from sudden stress on shortened muscle, leg-length discrepancies or skeletal asymmetry are thought to be common causes of myofascial pain. Poor posture, assumption of a static position for a long period also has been implicated in myofascial pain.

Some general features are agreed as clinical characteristics of myofascial Trigger point like compression may elicit local pain or referred pain or aggravate the existing pain, snapping palpation may elicit a local twitch response that is a brisk contraction of the muscle fibers in or around the taut band, restricted range of stretch, and increased sensitivity to stretch or muscle fibers in a taut band may cause tightness of the involved muscle.

The criteria are the possibility of reproducing spontaneous pain in the trigger point after multiple pressing and relief of the pain by muscle stretching and by injection into the muscle.

The Trapezius muscle is probably the most often beset by myofascial trigger points. It is a frequently overload source of Temporal headache. The upper trapezius muscle has two trigger points.

Currently TENS is one of the most commonly used forms of electroanalgia. Hundreds of clinical reports exist concerning the use of TENS for various types of conditions such as low back pain, myofascial and arthritic pain, sympathetically mediated pain, bladder incontinence, neurological pain, visceral pain, and post surgical pain. As

many of these studies were uncontrolled, there has been ongoing debate about the degree to which TENS is more effective than placebo in reducing pain.

The currently proposed mechanisms by which TENS produces neuromodulation includes presynaptic inhibition in the dorsal horn of the spinal cord, endogenous pain control (via endorphins, enkephalins, and dynorphins), direct inhibition of an abnormally excited nerve and restoration of afferent input.

TENS unit consist of one or more electric signal generators, a battery, and a set of electrodes. The units are small and programmable, and the generators can deliver trains of stimuli with variables current strengths, pulse rates, and pulse widths. The preferred waveform is biphasic, to avoid the electrolyte and iontophoretic effects of unidirectional current. The three options for the standard settings used in different therapeutic methods are conventional, acupuncture like settings and pulsed TENS.

Thus, there are many literatures stating the individual effect of TENS and trigger point release in treating the Myofascial pain of upper trapezius. In this study, an effort has been made to find out the significant difference between the two modalities in reducing the pain intensity and increasing the pain threshold in subjects with myofascial trigger points in upper trapezius.

NEED FOR THE STUDY

Trigger point is a hyperirritable spot in skeletal muscle that is associated with a hypersensitive palpable nodule in a taut band. The spot is painful on compression and can give rise to characteristic referred pain, referred tenderness, motor dysfunction and autonomic phenomena

Many studies suggests that various treatments are available for treating the myofascial trigger points like Myofascial release, Muscle energy technique, Trigger point therapy, Myotherapy, Stretching, Postural correction, Ultrasonic therapy, acupuncture, Transcutaneous electrical nerve stimulation (TENS) and electrical muscle stimulation (EMS)

This study is designed to investigate the effectiveness of trigger point release on Myofascial trigger point syndrome of upper trapezius in comparison with Transcutaneous Electrical Nerve Stimulation.

OPERATIONAL DEFINITIONS

TRIGGER POINT

Pain related to a discrete, irritable point in skeletal muscle or fascia, not caused by acute local trauma, inflammation, degeneration, neoplasm or infection.

Dr.janet travel(1946)

TENS [Transcutaneous Electrical Nerve Stimulation]

TENS by definition covers the complete range of transcutaneously applied currents used for nerve excitation although the term is often used with a more restrictive intent, namely to describe the kind of pulses produced by portable stimulators used to treat pain.

Belanger,AY(1991)

VISUAL ANALOGUE SCALE

A **visual analogue scale** (VAS) is a psychometric response scale which can be used in questionnaires. It is a measurement instrument for subjective characteristics or attitudes that cannot be directly measured. When responding to a VAS item, respondents specify their level of agreement to a statement by indicating a position along a continuous line between two end-points. This continuous (or "analogue") aspect of the scale differentiates it from discrete scales such as the Likert scale.

Appleton and Lange(1960)

AIM OF THE STUDY

- The aim of the study is to find the difference in the effectiveness of TENS and TENS with trigger point release in reducing myofascial pain of upper trapezius.

OBJECTIVES OF THE STUDY

- To find out the effects of TENS in reducing the Myofascial pain in upper trapezius.
- To find out the effects of trigger point relase in reducing the Myofascial pain in upper trapezius.
- To compare the effectiveness of TENS and trigger point relase in reducing the Myofascial pain in upper trapezius.

HYPOTHESIS

NULL HYPOTHESIS

- There is no significant difference between TENS and trigger point relase in reducing the Myofascial pain in upper trapezius.

ALTERNATE HYPOTHESIS

- There is significant difference between TENS and trigger point relase in reducing the Myofascial pain in upper trapezius.

REVIEW OF LITERATURE

- **Gerwin RD et al.,(2005)**

Concluded that chronic muscle pain is a common problem throughout the world. The two common muscle pain conditions are fibromyalgia and myofascial pain syndrome. Myofascial pain syndrome is an overuse or muscle stress syndrome characterized by the presence of trigger point in muscle.

- **Edwards J et al.,(2005)**

Analyzed various structural abnormalities that contribute to the perpetuation of myofascial trigger point activity and the pain arising from it. These postural habits that are likely to be carried out both frequently and unconsciously are adopted during the course of sitting, standing or sleeping. They are entirely independent of any structural abnormalities that may be present. Correcting them is a necessary contribution to treatment, as failure to do so is liable to lead to persistence of the pain.

- **Augusto Caraceni MD et al (2005)**

Validated the use of Numerical Pain Rating Scale and Verbal Pain Rating Scale to asses the pain of an individual, he correlated them to measure the intensity of pain in clinical trials and also in their research studies in which pain was considered as one of the parameters.

- **Wheeler AH et al.,(2004)**

Concluded that myofascial pain disorders are characterized by the presence of tender, firm nodules called trigger points. Within each trigger point is a hyperirritable spot, the ‘taut-band’, which is composed of hyper contracted extrafusal muscle fibers.

Palpation of spot within the trigger point provokes radiating, aching-type pain into localized reference zones. Mechanical, thermal and chemical treatments, which neurophysiologically or physically dennervate the neural loop of the trigger point, can result in reducing pain and temporary resolution of muscular over contraction.

- **Majlesi J and Unalan H, et al., (2004)**

  Turkey studied the effects of a high power, pain threshold; static ultrasonic technique applied to acute points of myofascial trigger of the upper trapezius on pain and found that the treatment of patients with acute myofascial pain syndrome can be done with ultrasound therapy.

- **M.Testa et al (2003)**

  Stated the clinical signs of trigger points, including the taut band, jumping sign, reproduction of the patient's pain, local twitch response, referred pain, restricted range of motion, muscle weakness and associated phenomena, are well described with multiple up-to-date references. The minimal criteria to identify trigger point are the presence of a taut band in the muscle, a very tender point in the taut band, and the patient's recognition of the pain.

- **Khusink.N.L. et al.,(2003)**

  Stated that tens with trigger point release in effective procedure in treating myofascial pain.

- **Beat Dejung.,et al.,(2003):**

  Stated that trigger point compression and manual stretching to the trigger point is effective procedure in treating myofacial pain.

- **Hakguder et al., (2003)**

  Stated that the efficacies of low level laser therapy in myofascial pain syndrome. Their aim was to clarify the effect of low-level laser therapy in MPS by using algometry and thermography. The outcome measures were pain measured with visual analog scale, algometry on the trigger points, algometric difference, thermographic difference, and thermal asymmetry. The result showed significant improvement.

- **Hong CZ, et al., (2002)**

  Clarified the mechanism of Myofascial trigger point. He said that there are multiple Myofascial trigger points loci in an Myofascial trigger points region. An Myofascial trigger points locus contains a sensory component (sensitive locus) and a motor component (active

  locus). A sensitive locus is the site from which pain, referred pain and local twitch response can be elicited by needle stimulation.

- **Hong CZ, et al., (2002)**

  The pathogenesis of Myofascial trigger points appears to be related to the integration in the spinal cord in response to the disturbance of the nerve endings and abnormal contractile mechanism at multiple dysfunctional endplates. Methods usually applied to treat Myofascial trigger point include stretch, massage, thermotherapy, electrotherapy, laser therapy, Myofascial trigger point injection, dry needling, and acupuncture.

- **Chu J and Schwartz I, et al., (2002)**

Proposed that needling methods such as acupuncture, primarily effect pain relief in myofascial pain through a local mechanism, elicitation of muscle twitches. Twitch elicitation has been observed to be essential to obtain myofascial pain relief associated with the needling methods of automated and electrical twitch obtaining intramuscular stimulation.

- **Fusun Ardic, et al., (2002)**

From the Department of Physical Medicine and Rehabilitation, Turkey compared the effect of transcutaneous electrical nerve stimulation (TENS) and electrical muscle stimulation (EMS) on myofascial trigger point of upper trapezius muscle on a total of 40 patients randomly divided in to three groups. Subjective pain intensity with visual analog scale, range of motion, and pain threshold were assessed before, immediately after two-week treatment and 3 months after treatment. The results supported the usage of TENS.

- **Hanten WP, et al., (2001)**

Conducted an that Myofascial trigger points are found among patients who have neck and upper back pain. The purpose of this study was to determine the effectiveness of a home program of ischemic pressure followed by sustained stretching for the treatment of myofascial trigger points. The results of the study indicated that clinicians can treat myofascial trigger points through monitoring a home program of ischemic pressure and stretching.

- **William P Hanten,Sharon L Olson,Nicole L Butts and Aimee L Nowicki.et al.,(2000)**

  Studied the effectiveness of home programme ischemic pressure followed by the sustain stretch.they concluded that home programme consisting of ischemic pressure and sustained stretching is effective in reduce trigger point sensitive and pain intensity.

- **Esenyel M, et al., (2000)**

  The effectiveness of ultrasound treatment and trigger point injections in combination with neck-stretching exercises on myofascial trigger points of the upper trapezius muscle. The study population comprised 102 patients who had myofascial trigger points in one side of the upper trapezius. Patients with myofascial pain syndrome had higher scores for anxiety than for depression. When combined with neck stretching exercises, ultrasound treatment and trigger point injections were found to be equally effective.

- **Katarzyna Gustaw,et al., (2000)**

  A study on myofascial pain syndrome in agricultural worker in Poland and found in common because of biomechanical hazard. The patient treated with TENS and EMS, sertraline and both. Finally concluded that TENS and EMS shows better effect on neuropsychological test like Beck depression inventory and Montgomery asberg depression rating scale.

- **Hsueh TC, et al., (1997)**

  The immediate effectiveness of electrotherapy on myofascial trigger points of upper trapezius muscle with sixty patients (25 males and 35 females).The effectiveness of treatment was assessed by conducting three measurements on each muscle before and immediately after treatment: subjective pain intensity (PI) with a visual analog scale, pressure pain threshold (PT) with algometry, and range of motion (ROM) with a goniometer of upper trapezius muscle. It was concluded that electrical nerve stimulation is more effective for immediate relief of myofascial trigger point pain than EMS.

- **Han SC**, **Harrison P, et al., (1997)**

  Concluded that Myofascial pain syndrome is a common condition often resulting in referral to a pain clinic. The incidence of Myofascial pain syndrome with associated trigger points appears to vary between 30% and 85% of people presenting to pain clinics, and the condition is more prevalent in women than in men. Patients complain of regional persistent pain, ranging in intensity and most frequently found in the head, neck, shoulders, extremities, and low back. The definitive pathogenesis of Myofascial pain syndrome is currently unknown, and no single diagnostic method is consistently positive.

- **Fricton JR & Steenks MH, et al.,(1996)**

  From the Department of Diagnostic and Surgical Sciences, USA defined Myofascial pain (MFP) is a regional muscle pain disorder characterized by localized muscle tenderness and pain and is the most common cause of persistent regional pain Management of the syndrome follows with palliative care, splint therapy, muscle

exercises, therapy to the trigger points, and behavioral therapy that depends on complexity of the case.

- **Fricton JR, et al., (1996)**

  Conducted that the short term goals is to restore the muscle to normal length, posture, and full joint range of motion with exercises and trigger point therapy. The long term goals include reducing the symptoms and their negative effects while helping the patient return to normal function without need for further health care.

- **Airaksinen O, Pontinen PJ, et al., (1992):**

  Studied the effects of electrical stimulation by simple pocket size stimulator on myofascial trigger points on 14 patients. They were assessed for pain threshold (PTH) using algometry. The effects of 30 seconds stimulation increased the PTH values. These results suggested that the stimulation had positive effects on myofascial trigger points.

MATERIAL AND METHODOLOGY

MATERIALS

- Transcutaneous electrical nerve stimulator
- Accessories such as electrodes, leads, cables
- Mackintosh sheets
- Towels, pillows and treatment couch
- Electrode gel with cotton swabs
- Kidney tray and a bowel of water
- Visual analogue scale
- Chair
- Powder

METHODOLOGY

STUDY DESIGN

- Experimental study design with pretest and posttest.

STUDY SAMPLE

- Study sample consists of 15 subjects in each group.

STUDY METHOD

- Subjects were divided into control group and Experimental group.

CONTROL GROUP

- 15 subjects were treated with TENS as a conservative**.**

EXPERIMENTAL GROUP

- 15 subjects were treated with TENS and trigger point release

SAMPLING TECHNIQUE

The sample is selected by using purposive sampling Technique

SELECTION CRITERIA

INCLUSION CRITERIA

- Myofascial Trigger points in unilateral upper Trapezius.
- Age between 20 to 40 years
- Both Male and Female subjects.
- Exquisite spot tenderness of a nodule on a taut band
- Subjects with unilateral involvement(mainly right side)

EXCLUSION CRITERIA

- Recent surgery or open wounds in the neck region
- Recent fractures in the back or neck
- Skin diseases and lesions in the area of trapezius

- Any sensory disturbances in the trapezius region.
- Bilateral Myofascial Trigger Points in upper Trapezius
- Individual with neurological symptoms in upper trapezius
- Cardiovascular patients fitted with Pace makers.

STUDY SETTING

Richmondhospital, Coimbatore

Bone and joint hospital. Coimbatore

STUDY DURATION

Period of study is for four month

MEASUREMENT PARAMETER

Visual analogue scale

TREATMENT TECHNIQUE

Control Group

TENS (Transcutaneous Electrical Nerve Stimulation)

Patients were positioned to prone lying and the treatment part shard be exposed, the electrodes should be placed over the area of pain in trazpezius muscle, in frequency above 100, and pulse duration on 50 – sec,10 – 15 minutes duration of treatment.

The post test measurement of pain was collected at the end of the seventh day in a similar manner as that of pretest measurement.

Experimental Group

Experimental group received TENS with Trigger point release.

1.TENS (Transcutaneous Electrical Nerve Stimulation)

Patients were positioned to prone lying and the treatement part shard be exposed, the electrodes should be placed over the area of pain in trazpezing muscle,in frequency above 100,and pulse duration on 50 – 80sec,10 – 15 min duration of treatement.

2.TRIGGER POINT RELEASE

PALPATORY PROCEDURE

Localized tenderness has been found to be a reliable indicator of presence and severity of myofascial pain by manual ‘drag method’ palpating the active trigger point with sustained deep single finger pressure on the taut band will elicit the pain towards the zone of reference.

Trigger point release involved.

- ❖ Ischemic compression
- ❖ Unilateral strectching

ISCHEMIC COMPRESSION

After locating the trigger point, a firm digital compression was applied with a single finger pad. The pressure was gentle at the beginning and was gradually progressed deeper into tissues and worked approximately upto 4 kilograms of force. It was performed very slowly to accommodate the patient’s pain threshold level.

The compression was maintened for 5second and released it for 2-3 sec. this same cycle was repeated till the patient has reported a reduction in local or referred pain or an increase in pain or until 2 miniutes has passed without any change in pain level

A small amount of talcum powder was applied over the trigger point,before this procedure inorder to reduce the noxious skin friction.

After this method subjects were brought to the position of comfort by bending the head to the same side which was held for 60-90 seconds.

UNILATERAL STRETCHING

Patients were positioned in supine lying, the researcher stood by the side of the patient head facing his feet and placed the web space of one hand at the base of the occipit to stabilize the distal fibres of the upper trapezius.

The other hand was placed over the patients shouldered with the fingers pointing down the patient's arm and pushed down towards the feet and the stretch was held for about 20 seconds , which was repeated 5 times with adequate rest period.

The post test measurementof pain were collected at the end of the seventh day in a similar manner as that of pretest measurement.

Statistical tools

In the study 't' test is used to analyse the result.

The intra group analysis was done using paired 't' test.

Paired 't' test

$$t = \frac{\overline{d}\sqrt{n}}{s}$$

$$s = \sqrt{\frac{\sum d^2 - \frac{(\sum d)^2}{n}}{n-1}}$$

d - means of deviation

n - Total member of subjects

s - standard deviation

$\sum d^2$ - sum of squared deviation

Unpaired t- test

Unpaired t- test to assess the changes between the group.

$$t = \frac{\overline{X}_1 - \overline{X}_2}{S} \sqrt{\frac{N_1 N_2}{N_1 + N_2}}$$

$$S = \sqrt{\frac{\sum (x1 - \overline{x1})^2 + \sum (x2 - \overline{x2})^2}{n1 + n2 - 2}}$$

X_1 - mean of control group.

X_2 - mean of experimental group .

N_1 – number of subjects in control group .

N_2 – number of subjects in experimental group .

S - Standard deviation

Procedure

After getting informed consent 30 subjects selected using purposive sampling techniques and assigned into two groups.

The subjects of control group were given TENS and experimental group were given TENS and Trigger Point Release.

Pain was evaluated using VAS scale before and after the treatment as pretest and post respectively. The datas were tabulated and analysed using‘t’ test and were tested for significance.

DATA PRESENTATION

TABLE I

PRE TEST AND POST TEST VALUE OF TENS OF CONTROL GROUP

S.no	Pre test	Post test
1	8	5
2	7	5
3	6	4
4	6	3
5	7	5
6	7	5
7	8	6
8	8	3
9	5	5
10	8	4
11	6	4
12	7	4
13	7	3
14	5	5
15	7	4

TABLE II

PRE TEST AND POST TEST VALUE OF TENS OF EXPRIMENTAL GROUP

S.no	Pre test	Post test
1	9	3
2	8	2
3	7	1
4	6	1
5	6	2
6	6	1
7	7	2
8	6	1
9	8	2
10	6	1
11	7	2
12	6	1
13	7	1
14	8	1
15	8	2

DATA ANALYSIS AND INTERPRETATION

TABLE –III

ANALYSIS OF PRE-TEST AND POST-TEST DATA OF CONTROL GROUP

GROUPS	TENS	
Control group	Pre test mean value	Post test mean value
	6.80	4.33
Paired 't' test	7.04	
P value and its significance	P value < 0.05 is significant	

For 14 degrees of freedom at 5% level of significance, the student 't' test value for control group (TENS) was 7.04 and the critical value was 1.761, which states that there exists significant difference between the pre test and post test values of control group.

GRAPH I

ANALYSIS OF PRE-TEST AND POST-TEST DATA OF CONTROL GROUP

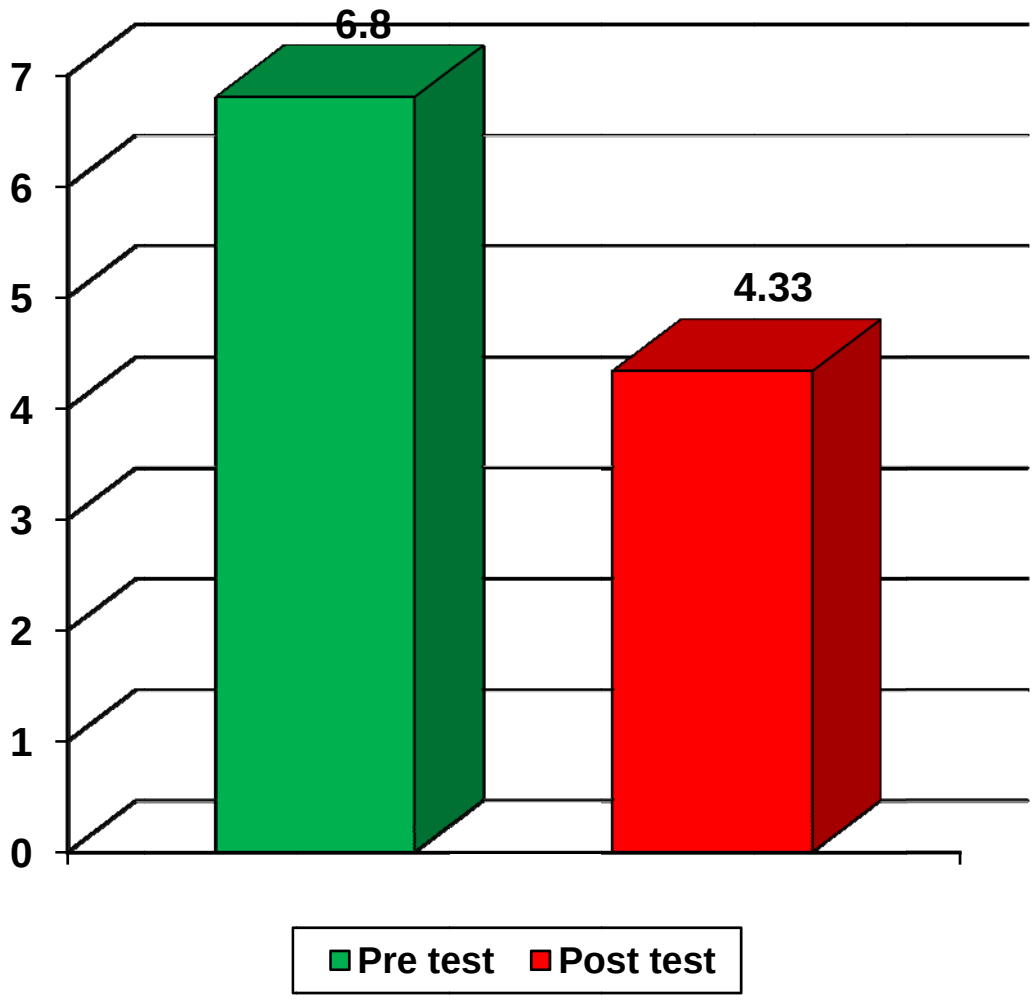


TABLE IV

ANALYSIS OF PRE TEST AND POST TEST VALUES OF EXPERIMENTAL GROUP

GROUPS	**TENS WITH TRIGGER RELASE**	
Experimental group	Pre test mean value	Post test mean value
	7.0	1.53
Paired 't' test	28.48	
P value and its significance	P value < 0.05 is significant	

For 14 degree of freedom and at 0.05 level of significance, the critical value is 1.761 and the calculated value is 28.48. Since the calculated value is more than the critical value, there exist a significant difference between pre test and post test value of experimental group.

GRAPH II

ANALYSIS OF PRE TEST AND POST TEST VALUES OF EXPERIMENTAL GROUP

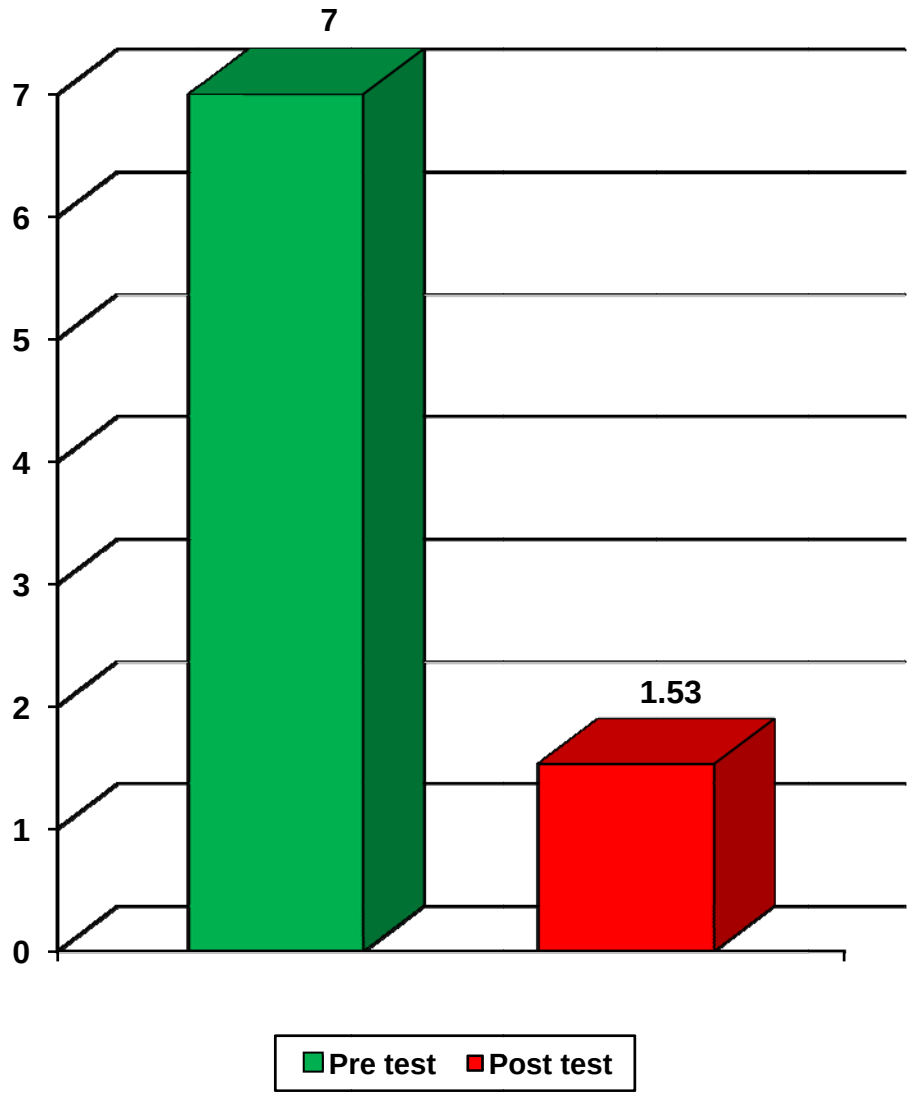


TABLE V

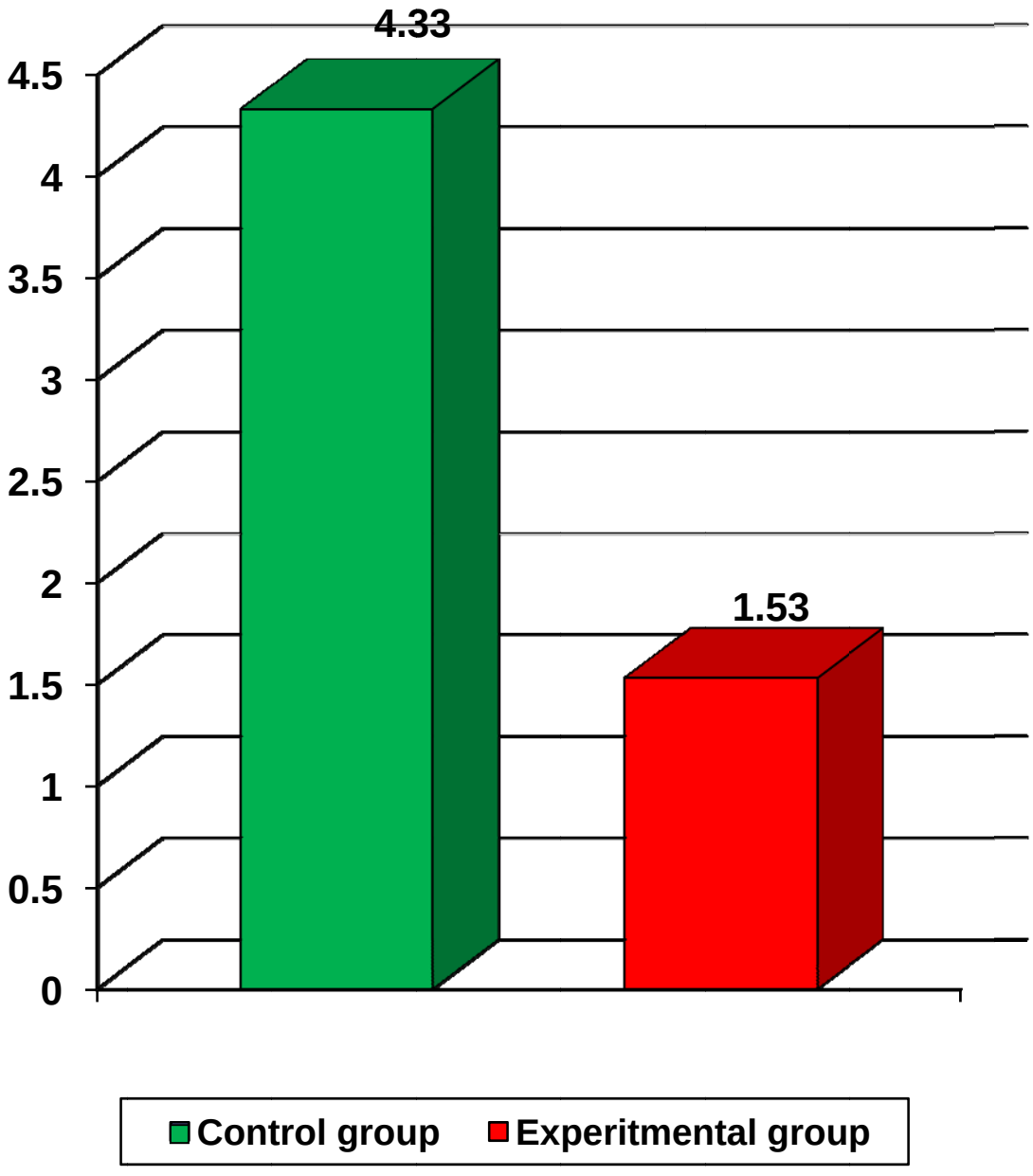
ANALYSIS OF POST TEST VALUES OF CONTROL GROUP AND EXPERIMENTAL GROUP

TESTS	**TENS AND TENS WITH TRIGGER RELASE**	
Post test mean value	Control Group	Experimental Group
	6.8	7.0
Un paired ‘t’ test	8.80	
P value and its significance	P value > 0.05 is insignificant	

For 28 degrees of freedom at 5% level of significance, the calculated post test ‘t’ value between control group and Experimental group was 8.80 and the critical value was 1.701, which states that there is no significant difference between two groups.

GRAPH III

ANALYSIS OF POST TEST VALUE OF CONTROL GROUP & EXPERIMENTAL GROUP



RESULTS

Effectiveness of control Group is elicited comparing the pre test and post test values of control group using paired‘t’ test; the calculated value is 7.04 , whereas the critical value is 1.761. Since the calculated value is greater than the critical value, there exists a significant difference between the pretest and post test values of control group. When comparing the mean values of both, the post test mean value 4.33 is lesser than the pre test mean value 6.8 which confirms that there is a significant reduction in myofacial pain of upper trapezius.

Effectiveness of Experimental group is elicited by comparing the pretest and post test values of Experimental group using paired‘t’ test, the calculated value is 28.48, whereas the critical value is 1.761. Since the calculated value is greater than the critical value, there exists a significant difference between the pretest and post test values of Experimental group. When comparing the mean values of both, the post test mean value 1.53 is lesser than the pre test mean value 7.0, which confirms that there is a significant reduction in myofacial pain of upper trapezius.

While comparing the post test value of control group and experimental group subjects using unpaired ‘t’ test is 8.80 where as the critical value is 1.761.since the calculated value is more than the critical value, it states that there is significance difference between the post values of both control group & experimental group. Hence it conforms that there is a significant improvement in post test value of experimental group than the post test value of control group. Hence the alternative hypothesis is accepted.

DISCUSSION

In this study thirty patients with myofascial trigger points in upper trapezius were selected and assigned randomly into two groups of fifteen subjects each who received TENS and trigger point release respectively. Intensity of Pain was the parameter considered for the study and it was measured using visual analogue scale before and at the end of two weeks of treatment programme.

The results analyzed with these values statistically showed that there was significant difference in the mean improvement in both groups; the TENS group showing more improvement than the other. The results were significant at $p<0.05$, thus accepting the experimental hypothesis and rejecting the null hypothesis stating that there is significant difference with Transcutaneous Electrical Nerve Stimulation(TENS) over trigger point release in reducing the intensity of pain in patients with Myofascial trigger points in upper Trapezius.

These results were significant at $p<0.05$ and it strongly supports the earlier findings of **Ardic F (2002)** in which they proposed that electrotherapy is a useful treatment modality for Myofascial pain syndrome. Also, the study done by **Hsueh (1997)** supports our results that there is a significant reduction in the pain intensity and improvement in pain tolerance in Myofascial Trigger Point Patients.

This study was done with both male and female patients so that there is a chance of comparison of both sexes. Moreover both the groups showed considerable patience and interest in following the protocol and found benefit with reduction of pain at the end of two weeks. This study was based on the information got from many reviews and an

innovative analysis to find out the effectiveness between the two different aspects of physiotherapy and through the findings we inferred that both groups had better outcome, the group trained with TENS with trigger point release had superiority over the other.

The Group treated with TENS and trigger point release showed 55% reduction in pain intensity and 31% increase in pain threshold when compared to the which was treated with TENS alone group where there was only 25% reduction in pain intensity.

A study done by **Cheng et al (1997),** shows that the trigger release on was significantly better in improving the range of motion in patients with restricted range due to pain caused by Myofascial trigger points, hence further studies can be promoted in this regard. Also the previous literatures are strongly supporting the short term use of the electrotherapy modalities in pain relief.

This study implies that the Trancutaneous Electrical Nerve Stimulation and trigger point release both can be used for pain relieving purpose, still TENS with trigger point release is more effective to obtain better results.

SUMMARY AND CONCLUSION

SUMMARY

A prospective study of thirty myofascial trigger points in upper trapezius were considered to determine the effectiveness of transcutaneous electrical nerve stimulation and trigger point relase over in reducing the myofascial trigger point pain in upper trapezius.

Data analysis showed that there is significant reduction in pain threshold with both the treatment modalities, but when compared between the two procedures for effectiveness, the results were significant for transcutaneous electrical nerve stimulation with trigger release. Thus, this study accepts the experimental hypothesis.

Thus transcutaneous electrical nerve stimulation with trigger release significantly enhanced the rate of pain reduction in myofacsial trigger point in upper trapezius and the choice of treatment varies with the physiotherapist's knowledge and his choice of treatment protocol.

CONCLUSION

Thus, the study concluded that transcutaneous electrical nerve stimulation and trigger release point shows more have got beneficial effect in reducing the pain intensity in patients with myofascial trigger point in upper trapezius.

LIMITATION AND SUGGESTION

- As this study was done only with patients in myofascial trigger points in upper trapezius, further studies are suggested to detect the progress in other types of Myofascial Pain Syndrome.
- In this study subjects were tested for only pain relief, similar studies could be done to detect the improvement in range of motion affected.
- Further studies should have multiple age groups, as this study was considered for only 20-40 years.
- As the study was done for a short period, a long term study can be done.

BIBLIOGRAPHY

1) **JANET G TRAVELL, DAVID G SIMONS**; *Myofascial Pain and Dysfunction- The Trigger Point Manual, The Upper Extremities; Volume-1;* Williams & Wilkins Publishers; 1983; 2-3,183-192.
2) **CHAG-ZERN HONG**; *Myofascial trigger points: Pathophysiology and correlation with acupuncture points; Acupuncture in Medicine;* Jun, 2000, 18(1):41-47.
3) **KATARZYNA GUSTAW;** *Myofascial pain syndrome in farmers – A comprehensive approach to treatment; Ann Agric Environ Med;* 2000; 7:95-99.
4) **B.D. CHAURASIA'S;** *Human Anatomy Regional and Applied;* CBS Publishers & Distributors; 3rd edition, 2003; 96.
5) **BONNIE PRUDDEN;** *Myotherapy ;* The Dial Press; 2nd Edition, 1984; 342-4.
6) **VLADIMIR KAYE,** MD; *Transcutaneous Electrical Nerve stimulation ; emedicine* ; 2005 ; Aug, 26
7) **JOHN LOW, ANN REED;** *Electrotherapy Explained, Principles and Practice*; Butterworth Hennemann, 3rd edition, 2000; 80-86.
8) **MERYL ROTH GERSH**; *Electrotherapy in Rehabilitation;* F A Davis Company; 2004; 218&223.
9) **SHEILA KITCHEN & SARAH BAZIN;** *Clayton's Electrotherapy; W.B.Saunders Company; 10th Edition,* 1996; 129-131.
10) **EDWARDS J;** *The importance of postural habits in perpetuating myofascial trigger point pain; Acupuncture Medicine;* Jun, 2005; 23(2):77-82.

11) **WHEELER AH;** *Myofascial pain disorders: theory to therapy; Drugs*; 2004; 64(1):45-62.

12) **M TESTA, M BARBERO, E GHERLONE;** *Trigger points: Update of the clinical aspects; European Medical Physiology;* 2003; 39:37-43.

13) **HONG CZ**; *New trends in myofascial pain syndrome; Zhonghua Yi Xue Za Zhi (Taipei);* Nov, 2002; 65(11):501-512.

14) **CHU J SCHWARTZ I**; *The muscle twitch in myofascial pain relief: effects of acupuncture and other needling methods; Electromyography Clinical Neurophysiology;* Jul-Aug, 2002; 42(5):307-11.

15) **FUSUN ARDIC, MERIH SARHUS, OYA TOPUZ**; *Comparison of two different techniques of electrotherapy on myofascial pain; Journal of Back and Musculoskeletal Rehabilitation*; 2002; 16(1):11-16.

16) **HANTEN WP, OLSON SL, BUTTS NL, NOWICKI AL**; *Effectiveness of a home program of ischaemic pressure followed by sustained stretch for treatment of myofascial trigger points; Physical Therapy;* Apr, 2001: 81(4):1059-60.

17) **ESENYEL M, CAGLAR N, ALDEMIR T**; *Treatment of myofascial pain; American Journal of Physical Medicine and Rehabilitation;* Jan-feb, 2000; 79(1):48-52.

18) **HAN SC, HARRISON P**; *Myofascial pain syndrome and trigger-point management; Reg Anaesthiology;* Jan-Feb, 1997; 22(1):89-101.

19) **OMURA Y**; *Basic electrical parameters for safe and effective electrotherapeutics [electro-acupuncture, TES, TENMS (or TEMS), TENS and electro-magnetic field stimulation with or without drug field] for pain,*

neuromuscular skeletal problems, and circulatory disturbances; Acupuncture Electrotherapy Res, 1987; 12(3-4):201-25.

20) **REEVES JI, JAEGER B, GRAFF-RADFORD SB**; *Reliability of the pressure algometer as a measure of myofascial trigger point sensitivity; Pain*; Mar, 1986; 24(3):313-21.

21) **FRICTON JR, KROENING R, HALEY D, SIEGERT R**; *Myofascial pain syndrome of the head and neck: a review of clinical characteristics of 164 patients; Oral Surg Oral Med Oral Pathology*; Dec, 1985; 60(6):615-23.

22) **CAROLYN M HICKS**; *Research methods for clinical therapists;* Churchill Livingstone; 3rd edition:131-209

23) **SUSAN B O' SULLIVAN, THOMAS T SCHMITZ**; *Physical Rehabilitation Assessment and Treatment;* Jaypee Brothers; 2001; 101-132.

24) **GOULET CG, ARSENAULT AB, BOURBONNAIS D, LEVIN MF**;*Effects of transcutaneous electrical nerve stimulation on the reflex of muscles of different fibre type composition; Electromyography & Clinical Neurophysiologyl;*Sep,1997;37(6):335-42.

25) **BALDRY P;** *concomitant sympathetically mediated pain and myofascial trigger point pain; Acupuncture in Medicine;* May, 1994; 12(1):29-33.

APPENDIX – I

INFORMED CONSENT FORM

TITLE: A COMPARATIVE STUDY ON THE EFFECTIVENESS OF TENS WITH TRIGGER POINT RELEASE IN REDUCING MYOFASCIAL PAIN OF UPPER TRAPEZIUS.

INVESTIGATOR: ……..

PURPOSE OF THE STUDY:

I…….. ,have been informed that this study will work towards achieving the proprioception in chronic ankle sprain for me and other patients.

PROCEDURE:

Each term of the study protocol has been explained to me in detail.I understand that during the procedure, I will be receiving the treatment for a time per day. I understand that I will have to take this treatment for four months.

I understand that this will be done under……. supervision. I am aware also that I have to follow therapist's instructions as has been told to me.

CONFIDENTIALITY:

I understand that medical information provided by this study will be confidential. If the data are used for publication in the medical literature or for teaching purpose, no names will be used and other literature such as audio or video tapes will be used only with permission.

RISK AND DISCOMFORT:

I understand that there are no potential risks associated with this procedure, and understand that …….will accompany me during this procedure.

There are no known hazards associated with this procedure.

REFUSAL OR WITHDRAWL OF PARTICIPATION:

I understand that the decision my participation is wholly voluntary and I may refuse participate, may withdraw consent at any time during the study.

I also understand that the investigator may terminate my participation in the study at any time after he has explained me the reasons to do so.

I …… have explained to ……. the purpose of the research, the procedures required and the possible risks and benefits, to the best of my ability.

…… ……

Investigator Date

I ……. Confirm that …….. has explained me the purpose of the research, the study procedure and the possible risks and benefits that I may experience. I have read and I have understood this consent to participate as a subject in this research project.

…….. ……Subject

Date …….. ……..

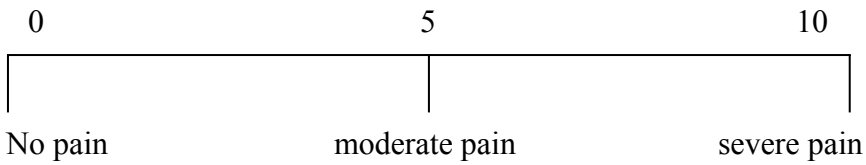
Signature of the witness Date

APPENDIX - II

VISUAL ANALOGUE SCALE

The Visual Analogue Scale (VAS) is designed to present to the respondent a rating scale with minimum constraints.

In study of knee pain **(THOMEE ET AL., 1995)** a VAS scale was presented to



Visual analogue scale is becoming widely used. The essential points about designing a VAS:

1. Other line should be 100mm long: other lengths are less reliable.
2. There should be a small vertical mark at each end, with numbers 0 and 10, and a verbal description.
3. The line itself should be clear of any markings and should be horizontal, not vertical for more reliable measurements. It is generally advised that previous course should not be shown to the patients.

APPENDIX -III

Subjective assessment

Name :

Age :

Sex :

Occupation :

Address :

Date of Admission :

Present complaint :

Past Medical History :

Personal history :

Objective Assessment

On Observation :

On Palpation :

On examination :

Measurement : Visual Analogue Scale

Progression chart : VAS scale for reduction in pain

S.no	Pre test value	Post test value

Signature of the physiotherapy student